

How to...

# FETTL BMW 'AIRHEAD' FLAT TWINS

*For twenty years, Bob Porecha has run his own business specialising exclusively in pre and post-war BMW airhead models. These are his tips on getting the best from them*

Words and photography: Gerard Kane

**I only work on pre and post-war airhead models.** I've never even ridden a K-series bike; they just don't interest me. My favourite is my 1937 R5. It was the first modern-looking BMW and it's one of the most desirable models for BMW collectors. I also have a 1960 R69. The quality of the engineering is phenomenal. To me, they are the real BMWs.

**When looking to buy a classic BMW** – or any bike really – look at the condition of the fasteners. You can tell a lot about a machine by the way the nuts and bolts have been treated. If they're damaged, rounded-off or whatever, there's a good chance the maintenance has been neglected or short-cuts have been taken. A BMW engine should be mechanically quiet. If it isn't, walk away.

**BMW twins are not cheap to repair or restore.** Genuine parts are expensive, but I won't use pattern parts unless I have to. I'm sure there are good pattern parts out there, but I've had experience of pattern fork and shaft gaiters that have split in less than a year – that's just not good enough. Don't get me started on pistons. A pair of genuine BMW pistons cost around £300 and a pair of pattern pistons are about half that. But you get what you pay for.

It's vital to use the right oil in BMWs. For all the pre-1970 models, that means a high detergent (HD) lubricant. But, if an engine has been run on normal oil, you can't just swap to HD oil without stripping the engine – the detergent in HD will loosen sludge deposits and with a filtration system that consists of a rudimentary strainer, that's not a good idea. Swap to HD when you're rebuilding the engine. Use monograde oil and change it (on pre-1970 bikes) every 1000 miles.

**I still see a lot of bikes running on the original ignition coils.** Often, they'll start up okay, but start misfiring when they've warmed up, or are hard to start when hot. That's a sign that the coil needs replacing. Genuine coils are still available at around £105.

**The lights on 6-volt models aren't brilliant** – in both senses of the word. The dynamo output on bikes made between 1952 and 1970 varies from 60 to 80 Watts depending on the year, so I recommend swapping the bulbs for LED replacements. The standard 6v21/5W brake/rear bulb potentially uses 26W, but an LED replacement draws just 4.5W and is much brighter. I favour halogen headlight bulbs for the same reason.

I sell LED bulbs for between £9.90 and £14.52 and a halogen headlight bulb for £12.15. They really make a difference. Dynamos rarely cause any trouble, but the original mechanical voltage regulators do. For £60, an electronic replacement is the way to go.

*"Before production moved to Berlin these bikes were built to aircraft standards"*

**BMW flat-twin engines are generally as near trouble-free as you can get.** But it all depends on who has re-built the engine. Pre-1970 bikes have a helical gear drive to the camshaft and they need setting up right. There are 20 different tolerances of gears available and a code stamped on the crankcases indicates which tolerance to use. If you mismatch gears they wear and become noisy. Before production moved from Munich to Berlin these bikes were built by engineers to aircraft standards and tolerances – aero engines were their core business. From 1970, the engines were redesigned, largely to allow for production by a less-skilled workforce, and have chain drive to the cam.

**Early (pre-1968) models** should use straight SAE 40 oil in the gearbox and the bevel box. Don't be tempted to use EP90 as the gearbox bushes aren't designed to cope with it. Post-1967 models have modified bushes and take EP80 or EP90.

**People not used to working on German machines** often over-tighten the fasteners on BMWs. Work to the torque settings given in the manual and you'll be all right. BMWs use a unique wave-type washer that doesn't bite into alloy casings – they help to keep everything in place.

**The gearbox is the Achilles' Heel of the flat-twin BMW.** The main problem is the engine-speed clutch. It's like having a non-synchromesh gearbox on a car. There's not much you can do about it except to take your time when changing gear. But most people get used to it with a bit of practice. Riders develop their own technique.

**If you're using an early model regularly,** handlebar indicators are a good retro-fit. They're in keeping with the bike and you only need them at the front because they're double-sided. I do a kit including a relay that fits inside the headlamp shell and a switch for £45. It takes about an hour to fit. It's a good idea to switch to LED bulbs at the same time to prevent overloading the dynamo.

**From 1970, BMWs really changed.** The /5 models can suffer from problems with wear on the rocker-arm bushes. I think the early four-speed models are probably the best. R60/5 models have too high a compression ratio and tend to pink.

The factory supplied thicker base gaskets, but they don't solve the problem completely. It's worth raising the carburettor needles a notch and/or retarding the ignition a little, but it's almost impossible to get them running 100 per cent right.

**The 1974-on /6 models have five-speed gearboxes,** but the selector spring can break sometimes, leaving you stuck in gear. A modified spring was produced but it's not much better. It's bad design really. You have to strip the gearbox for the sake of a 60p spring. The selector mechanism was re-designed for late /7 models and it's much better.

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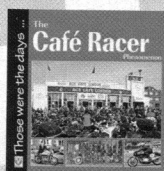
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A 1960 R60/2  
being refurbished  
for a customer



The alternators on /6 and /7 models can fail. But I can supply an exchange rotor for about £55 so it's not the end of the world.

If you have pannier frames fitted, it can be a job to remove the rear wheel for maintenance. To avoid having to take off the pannier frames, put the bike on its centrestand and drop the front wheel out. Next, replace the wheel spindle in the fork legs (remember to put the nut on the spindle) and then run a strap between the centre-stand and the spindle (that will stop the stand springing back). You can now tip the bike forward so it's resting on the fork legs and get enough clearance under the rear wheel to remove it with ease.

Be careful not to over-tighten the rocker adjuster nuts when setting valve clearances. It's easy to strip the thread. Always use a torque wrench.

In 1981, BMW re-designed the bevel box. They tend to leak oil past the brake spindle into the brake hub. BMW fitted first one then two O-rings on each side of the spindle to try to stop the leaks, but neither fix worked.

The simple solution is to use 20cc less oil in the bevel box. There will still be plenty of oil in there, but it drops the oil level below the level of the brake spindle – no more oil on the brake shoes.

On pre-1981 disc-braked models, a good upgrade is to mount a post-1981 Brembo master cylinder on the handlebar to replace the cable-operated master cylinder under the fuel tank.

Remember to grease the splines on the bevel box drive regularly (especially on 1985-on bikes) and strip and clean the carburettors at 50,000-mile intervals and you shouldn't have too much trouble.

I've got a customer who's a despatch rider and has covered 230,000 miles on his 1983 R80ST – he's never had the bottom end of the engine apart. Regular oil changes and services are the secret. Change the oil and filter on post-1970 bikes at 5000-mile intervals and always use genuine filters.

Probably the best combination of practicality and value is the 1978 R80. I think BMW production quality dipped a bit after 1979. 1978 was the last year of the double-row timing chain. That's the one to go for. It's a good compromise between power, size and economy. And you can pick them up for around £1500. That has to be a bargain.

## CONTACT:

Bob Porecha  
020 8659 8860

A-Z

## How to... BE A CLASSIC KNOW ALL

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**A Accelerator pump** Used in some carburettors to inject extra petrol into the fuel/air mix under acceleration, combating weakening of the mixture, and consequent lag in performance, caused by liquid (petrol) having greater inertia than gas (air).

**Acetylene** Combustible gas used in conjunction with oxygen to produce a flame of around 3300°C for welding and cutting metals. Acetylene is also the gas burned in a carbide lamp (fitted to many veteran and vintage motorcycles).

**Advance** The amount, measured in degrees, at which the ignition spark occurs before top dead centre.

**Aeration** When used in reference to oil, the undesirable incorporation of air into the lubricant resulting in frothing.

**Agony** Distressing physical or emotional sensation often associated with classic motorcycle ownership.

**Airbox** Where used, a chamber from which the fuel system draws air. Pressure waves created inside the airbox can be harnessed to aid fuelling, as can the pressurisation of the box by mechanical means such as a turbocharger or supercharger or by forward-facing feed ducts, which rely on the motorcycle travelling at speed to become effective.

**Air:fuel ratio** The proportion of air to fuel, usually petrol, which is mixed by the fuelling system to create a combustible charge.

**Air gap** The space between stationary and moving parts in electrical apparatus, for example, between the rotor and stator in an alternator. The correct gap is essential to the equipment's efficient functioning.

**Air lever** A control for a choke or slide in the carburettor throat that restricts the flow of air through the carburettor, to alter the air:fuel ratio. This is usually to enrich the mix for cold starting, but on early machines the air and petrol supply to the engine are independently controlled by air and throttle levers.

**Air slide** A block within a carburettor which, when lowered, restricts air flow and enriches the fuel/air mix to aid cold starting. Usually operated by cable via the air lever and also known as a choke.

